



CISCO CCNA

MANUAL DE COMENZI



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Introducere

Felicitari pentru descarcarea acestui ghid. Asta arata ca esti interesat de domeniul IT si mai ales ca iti doresti sa dobandesti abilitati noi, sa cresti si sa te dezvolti profesional si personal.

Cu ajutorul acestui eBook vei fi capabil:

- Sa configurezi echipamente de Retea (Router, Switch) Cisco
- Sa faci troubleshooting-ul retelei folosind cateva comenzi esentiale
- Sa aplici notiunile de retelistica in scenarii practice

Aceasta carte include scenarii de configurare din diferite concepte precum:

- **Configurari de baza** ale Routerelor si a Switch-urilor
- **Protocoale de Retea** (OSPF, EIGRP, eBGP, RIP)
- **Switching** (VLANs, STPs, VTPs)
- **Redundanta** (HSRP, EtherChannel)
- **Securitate** (ACL, Security Switching, VPN), etc.

Te rog sa ai in vedere faptul ca toate comenzile functioneaza si au fost testat pana la versiunea 15.1 a Cisco IOS (Sistemul de Operare existent pe Routerelor si Switch-urile Cisco). Daca intampini anumite probleme, te invit sa cauti pe Google rezolvarea lor.

Aceasta ghid este structurat in 4 capitole care cuprind diferite teme, apartinand comenzilor de baza pentru Cisco IOS. Aceasta carte acopera 90% din [comenziile din materia inclusa in CCNA](#). Daca iti doresti o cariera in Retele de Calculatoare, atunci iti recomand sa te axezi pe obtinerea acestei certificari, iar cea mai buna varianta este sa-ti dai certificarea **CCENT** (din materia CCNA 1 & 2).

Daca iti doresti sa inveti si mai multe despre Retele de Calculatoare si sa-ti dezvolti o cariera in directia asta, atunci [iti recomand cursul meu online de Retele](#) care te va duce pas cu pas prin notiunile de **care ai nevoie pentru a-ti lua certificarea CCENT si ulterior sa te angajezi in domeniu**.

Iti urez spor la treaba, iar daca ai intrebari nu ezita sa ma contactezi pe [email](#), [Facebook](#) sau [YouTube](#).

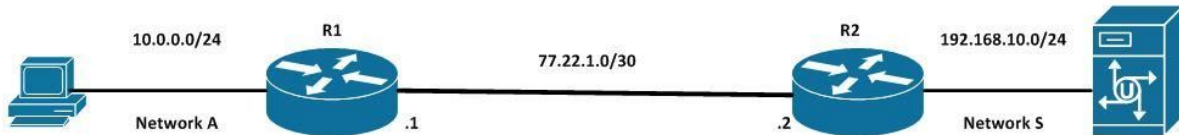
Ramon Nastase (cel care te sustine in procesul tau de crestere).

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Manual de Comenzi - CCNA Modulul 1

Sa presupunem ca pe parcursul acestei sectiuni avem urmatoarea topologie:



Comenzi de Baza

| | |
|--|--|
| Router> | //prompt-ul initial de pe Router (user exec) > |
| Router> enable | //trecem in privileged mode (#) |
| Router# | |
| Router# configure terminal | //trecem in modul global de configurare |
| Router(config)# | |
| Router(config)# hostname R1 | //setam numele (hostname) echipamentului |
| R1(config)# | |
| R1(config)# interface fastEthernet0/0 | //intram pe interfata Fa0/0 |
| R1(config-if)# ip address 192.168.1.1 255.255.255.0 | //setam adresa IP pe interfata |
| R1(config-if)# no shutdown | //pornim interfata |
| R1(config)# enable password AICI_INTRODUCI_PAROLA1 | //setam parola de enable (#) in clear text |
| R1(config)# enable secret AICI_INTRODUCI_PAROLA2 | //setam parola de enable (#) criptata |
| R1(config)# banner motd "UN MESAJ DE INTERZICERE A ACCES-ULUI pentru utilizatorii neautorizati" | |

Alte comenzi utile:

R1(config)#**service password-encryption** //cripteaza parolele nesecurizate din running config
R1(config)#**ip domain-name** *nume_domeniu.ro* //seteaza un nume de domeniu
R1(config)#**ip domain-lookup** //porneste rezolvarea de nume prin DNS (R1.nume.ro -> 10.0.0.1)

Configurare Telnet

R1(config)#**line vty** 0 4 //5 conexiuni simultane prin retea la Router
R1(config-line)#**password** cisco //seteaza parola la login pentru Telnet
R1(config-line)#**login** //porneste autentificarea folosind parola prin Telnet

Configurare SSH

R1(config)#**username** *nume* **password** *parola_cisco* //creeaza user si parola
R1(config)#**ip domain-name** *invata-retelistica.ro* //seteaza domeniul
R1(config)#**crypto key generate rsa modulus** 1024 //genereaza o pereche de chei (publice, private)
1024 biti

R1(config)#**ip ssh version** 2

R1(config)#**line vty** 0 4 //5 conexiuni simultane prin retea
R1(config-line)#**login local** //autentificare folosind user si parola
R1(config-line)#**transport input** ssh //acces de la distanta numai prin SSH

Configurare Linie Consola

R1(config)#**line console** 0
R1(config-line)#**password** *AICI_INTRODUCI_PAROLA* //seteaza parola la consola
R1(config-line)#**login** //porneste autentificarea

R1(config-line)#**logging synchronous**
log

//sincronizeaza mesajele, newline dupa fiecare

R1(config-line)#**exec-timeout 5**

//expira dupa 5 minute

Verificare

R1#**show running-config**

//ne arata config-ul de pe echipament

R1#**show ip interface brief**

//ne arata interfetele, ip-urile si starea lor (up/down)

R1#**show interfaces**

//informatii la nivelul 2 (nr de pachete, erori pe port)

R1#**show ip interfaces**

//ne arata detalii despre interfata la nivelul 3

R1#**show ip route**

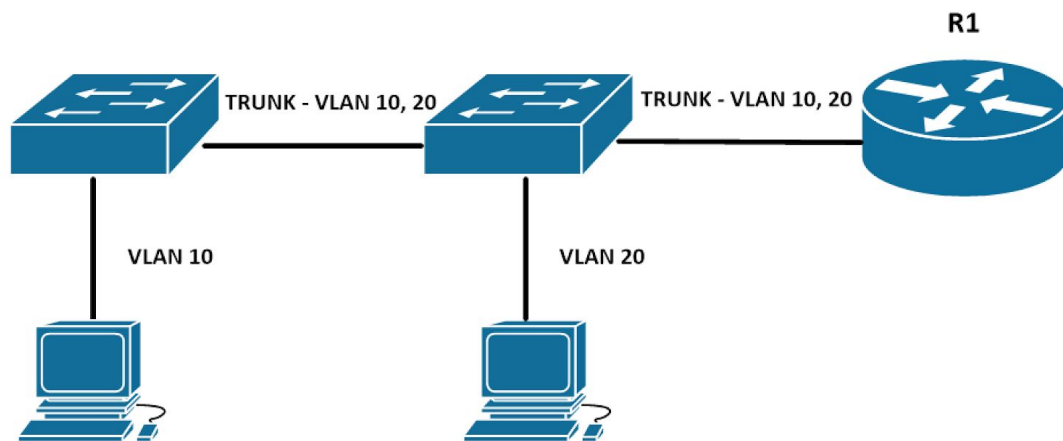
//tabela de rutare

R1#**show users**

//user-ii conectati la echipament (SSH, Consola)

Manual de Comenzi - CCNA Modulul 2

1) SWITCHING



Configurare VLAN

```
SW1(config)#vlan 10                                //creeam un VLAN cu id-ul 10
SW1(config-vlan)# name HR                           //dam un nume acestui VLAN
SW1(config)#vlan 20
SW1(config-vlan)# name IT
```

Verificare

```
SW1#show vlan [brief]
```


Configurare Interfete Trunk & Access

SW1(config)#**interface** fastEthernet0/1

SW1(config-if)#**switchport mode access**

//setam interfata in modul access

SW1(config-if)#**switchport access vlan 10**

//in VLAN-ul 10

SW1(config)#**interface** fastEthernet0/24

SW1(config-if)#**switchport trunk encapsulation dot1q**

SW1(config-if)#**switchport mode trunk**

//setam interfata in modul trunk

//pentru VLAN 10 si 20

SW1(config-if)#**switchport trunk allowed vlan 10,20**

Verificare

SW1#show interfaces trunk

SW1#show run interface fa0/24

SW1#show interface fa0/24 switchport

Configurare Port Security

SW1(config)#**interface** Gi0/1

SW1(config-if)#**switchport port-security**

//pornim securitatea pe port

SW1(config-if)#**switchport port-security violation [shutdown | restrict | protect]**

SW1(config-if)#**switchport port-security mac-address sticky**

SW1(config-if)#**switchport port-security maximum 3**

//maxim 3 adrese MAC

Verificare

SW1#show port-security

Comenzi de Verificare pe Switch-uri

SW1#show vlan [brief]

SW1#show interfaces fa0/1 switchport

SW1#show interfaces trunk

SW1#show run interface fa0/1

SW1#show port-security [address]

Configurare Router-on-a-Stick (RoaS)

//Pentru VLAN-urile 10,20 si 599 (Native)

R1(config)#interface Gig0/0

R1(config-if)#no shutdown

//pornim interfata principala

R1(config)#interface Gig0/0.10

R1(config-if)#encapsulation dot1q 10

//setam encapsularea ca fiind 802.1Q in VLAN 10

R1(config-if)#ip address 10.5.10.1 255.255.255.0

R1(config)#interface Gig0/0.20

R1(config-if)#encapsulation dot1q 20

//setam encapsularea ca fiind 802.1Q in VLAN 20

R1(config-if)#ip address 10.5.20.1 255.255.255.0

R1(config)#interface gig0/0.599

R1(config-if)#encapsulation dot1q 599 native

//setam encapsularea folosind VLAN-ul Native

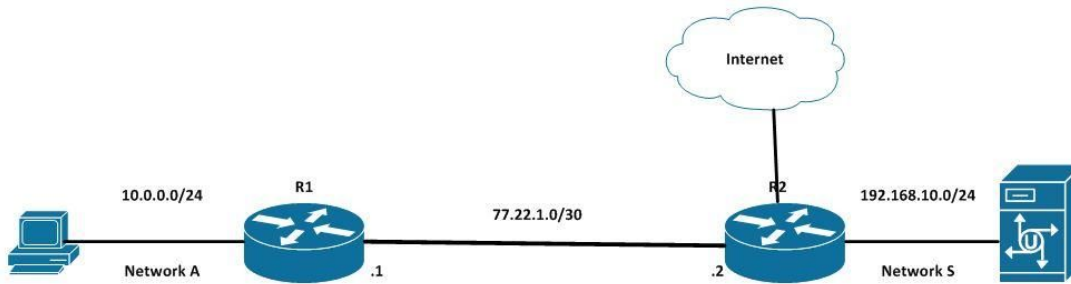
R1(config-if)#ip address 10.5.99.1 255.255.255.0

Comenzi de Verificare Router pentru Inter-VLAN Routing

R1#show ip route

R1#show ip interface brief

2) ROUTING



- **IPv4**

Configurare Rute Statice

```
R1(config)#ip route destination_network mask next_hop_IP
```

```
R1(config)#ip route 192.168.10.0 255.255.255.0 77.22.1.2
```

```
R1(config)#ip route 0.0.0.0 0.0.0.0 77.22.1.2 //ruta statica default (catre Internet)
```

Configurare RIPv2

```
R1(config)#router rip
```

```
R1(config-rtr)#version 2
```

```
R1(config-rtr)#no auto-summary
```

```
R1(config-rtr)#network 10.0.0.0 //adresa IP retea direct conectata
```

```
R1(config-rtr)#default-information originate //propaga ruta statica default (0.0.0.0/0)
```

Verificare

```
R1#show ip route
```

```
R1#show ip protocols
```

```
R1#show run | section [rip | route]
```

- **IPv6**

R1#ipv6 unicast-routing

//pentru pornirea IPv6 pe echipamente

Setare Adresei IPv6

R1(config)#**interface** Gig0/1

R1(config-if)#**ipv6 address** 2002:ABCD:1254::1/64

Configurare Rute Statice

R1(config)#**ipv6 route** *destination_network/mask next_hop_IP*

R1(config)#**ipv6 route** 2002:ABCD:1234::/64 2002:AAAA::1

R1(config)#**ip route** ::/0 2002:AAAA::1

Configurare RIPng

R1(config)#**ipv6 router rip** NUME

//creem un proces RIPng (IPv6)

R1(config-rtr)#**exit**

R1(config-if)#**interface** Gig0/0

R1(config-if)#**ipv6 rip** NUME **enable**

//pornim RIPng (IPv6) pe interfata

Verificare

R1#show ipv6 route

R1#show ipv6 interface brief

R1#show ipv6 protocols

R1#show run | section route

3) Servicii de Retea

Configurare DHCP pe Routere/Switch-uri

```
R1(config)#ip dhcp excluded-address 10.0.0.1 10.0.0.10
```

```
R1(config)#ip dhcp pool NUME
```

```
R1(dhcp-config)#network 10.0.0.0 255.255.255.0
```

```
R1(dhcp-config)#default-router 10.0.0.1
```

```
R1(dhcp-config)#dns-server 8.8.8.8
```

Verificare

```
R1#show ip dhcp binding
```

```
R1#show run | section dhcp
```

Configurare ACL

- Standard ACL

Creare ACL:

```
R1(config)#ip access-list standard NUME_ACL
```

```
R1(config-std-nacl)#[permit | deny] IP_Source Wildcard_mask
```

```
R1(config-std-nacl)#deny 10.0.0.0 0.0.0.255 //opreste traficul pentru retea  
10.0.0.0/24
```

```
R1(config-std-nacl)#permit any //permitem restul traficului
```

Aplicare ACL pe Interfata:

R1(config)#**interface** Gig0/0

R1(config-if)#**ip access-group** *NUME_ACL* [**in** | **out**] //setam ACL pe interfata si directia filtrarii

- **Extended ACL**

Creare ACL:

R1(config)#**ip access-list extended** *NUME_ACL*

R1(config-ext-nacl)#**[permit | deny]** [**IP** | **TCP** | **UDP**] *IP_Src Wildcard Port_Src IP_Dst Wildcard Port_Dst*

R1(config-ext-nacl)#**deny ip** *10.0.0.0 0.0.0.255 any* //opreste traficul sursa
10.0.0.0/24

R1(config-ext-nacl)#**deny tcp host** *10.0.0.10 192.168.2.0 0.0.0.255 eq 80* //opreste traficul
HTTP

R1(config-ext-nacl)#**deny tcp host** *10.0.0.10 192.168.10.0 0.0.0.255 eq 443* //opreste traficul
HTTPS

R1(config-ext-nacl)#**permit ip any any**

Aplicare ACL pe Interfata:

R1(config)#**interface** Gig0/0

R1(config-if)#**ip access-group** *NUME_ACL* [**in** | **out**] //setam ACL pe interfata si directia de filtrare

Verificare:

R1#show ip access-list

Configurare NAT

NAT Static:

```
R1(config)#ip nat inside source static 192.168.10.10 77.22.34.159
```

NAT Dinamic:

```
R1(config)#ip nat pool ADD_FOR_NAT 77.22.34.148 77.22.34.159
```

```
R1(config)#ip nat inside source list ACL_RETEA_NAT interface Gig0/0
```

NAT Overload (PAT):

```
R1(config)#ip nat inside source list ACL_RETEA_NAT interface Gig0/0 overload
```

Aplicare NAT pe interfata:

```
R1(config)#interface Gig0/1
```

```
R1(config-if)#ip nat NUME [inside | outside] //aplicam NAT pe interfete
```

//folosim **outside** (de obicei) pentru conexiunea cu Internet-ul / ISP

//**inside** pentru retelele internet

Verificare

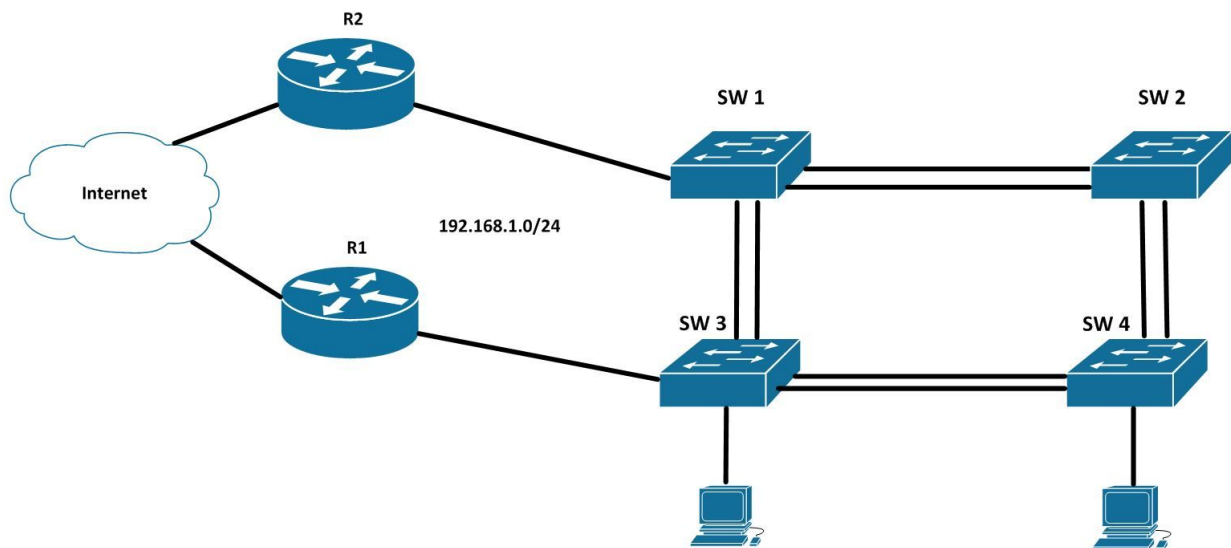
```
R1#show ip nat translation
```

```
R1#show run | section nat
```

Manual de Comenzi - CCNA Modulul 3

1) SWITCHING

Pentru acest modul de Switching vom folosi topologia de mai jos:



Configurare VTP

```
SW1(config)#vtp domain CISCO_DOMAIN
```

//cream un VLAN cu id-ul 10

```
SW1(config)#vtp mode [client | server | transparent]
```

//dam un nume acestui VLAN

```
SW1(config)#vtp password cisco
```

Verificare:

```
SW1#show vtp [status | password]
```

```
R1#show run | section vtp
```


Configurare Spanning-Tree Protocol

SW1(config)#**spanning-tree mode [pvst | rapid-pvst]** //setam versiunea STP-ului - PVST / RPVST+

SW1(config)#**spanning-tree vlan 10,20,30 [root | priority]** //setam prioritatea unui Switch in STP

SW1(config)#**interface Gi0/1**

SW1(config-if)#**switchport mode access**

SW1(config-if)#**switchport access vlan 10** //setam portul in VLAN-ul 10

SW1(config-if)#**spanning-tree portfast** //portul trece instant in FWD si opreste STP pe port

SW1(config-if)#**spanning-tree vlan 10 port-priority 112** //schimba prioritatea STP pe port

Verificare:

SW1#**show spanning-tree [vlan]**

R1#**show run | include spanning-tree**

Configurare EtherChannel

NOTE: Cand vine vorba de EtherChannel ambele (sau toate cele 4,6, 8 etc.) port-uri trebuie sa aiba aceeasi configuratie:

```
SW1(config)#interface range Gi0/1 - 2
```

```
SW1(config-if)#switchport trunk encapsulation dot1q
```

```
SW1(config-if)#switchport mode trunk
```

```
SW1(config-if)#switchport trunk allowed vlan 10,20,30
```

//setam interfata in mod trunk pentru VLAN-uri

```
SW1(config-if)#channel-group mode [active | passive] //seteaza protocolul LACP
```

```
SW1(config-if)#channel-group mode [desirable | auto] //seteaza protocolul PAgP (Cisco)
```

```
SW1(config-if)#channel-group mode on //porneste manual EtherChannel
```

Verificare:

```
SW1#show etherchannel [summary]
```

```
R1#show run | include channel-group
```

Configurare HSRP

Pe cele 2 Routere din topologia de mai sus vom seta HSRP (protocol ce asigura redundanta in retea pe dispozitive Layer 3).

```
R1(config)#interface Gi0/1
```

```
R1(config-if)#standby <0-255> ip Group_IP_Address
```

```
R1(config-if)#standby <0-255> preempt
```

```
R1(config-if)#standby <0-255> priority 0-255
```

```
R1(config-if)#standby <0-255> track Gi0/1 Priority_Decrement_Number
```

```
R1(config)#interface Gi0/1
```

```
R1(config-if)#standby 1 ip 192.168.1.5 //setam adresa IP virtuala a grupului HSRP
```

```
R1(config-if)#standby 1 preempt //inlatura Routerul Activ daca prioritatea e mai mica
```

```
R1(config-if)#standby 1 priority 120 //setam prioritatea unui Router
```

```
R1(config-if)#standby 1 track Gi0/1 40 //scade prioritatea in caz de down a Gi0/1
```

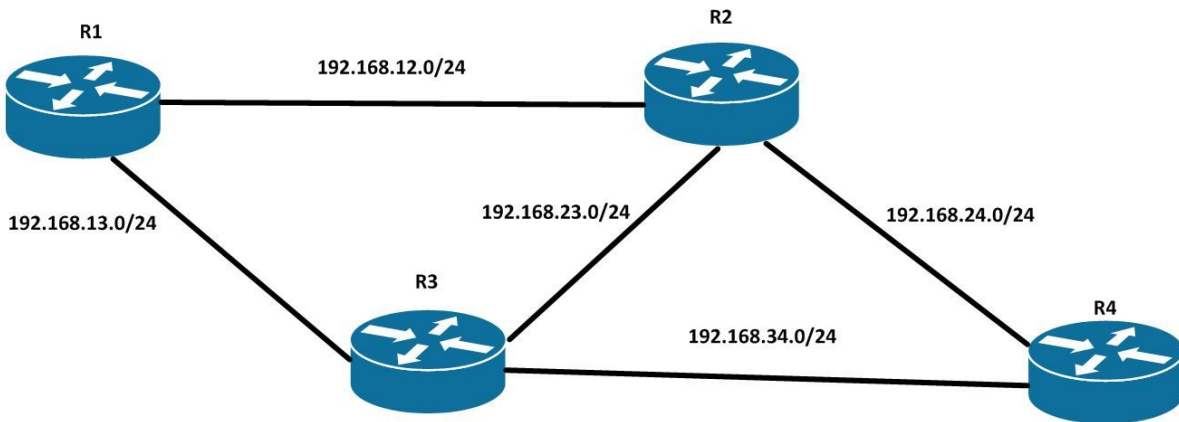
Verificare:

```
R1#show standby [brief]
```

```
R1#show run | section standby
```

2) ROUTING

Pentru acest modul de Routing vom folosi topologia de mai jos:



a) IPv4

Configurare OSPF

R1(config)#**router ospf** *Process_ID*

R1(router-config)#**network** *IP_Retea Wildcard_Mask* **area** *Numarul_Ariei*

R1(config)#**router ospf** 1

//porneste procesul OSPF pe Router

R1(router-config)#**router-id** 1.1.1.1

R1(router-config)#**network** 192.168.12.0 0.0.0.255 **area** 0

//porneste OSPF pentru retea in aria 0

R1(router-config)#**network** 192.168.13.0 0.0.0.255 **area** 0

Sau Setarea OSPF-ului pe Interfata

```
R1(config)#router ospf 1
```

```
R1(router-config)#exit
```

```
R1(config)#interface Gi0/0
```

```
R1(config-if)#ip ospf 1 area 0 //porneste OSPF in aria 0 pe interfata
```

```
R1(config-if)#ip ospf network [point-to-point | broadcast] //seteaza tipul interfetei in OSPFv3
```

OSPF Area Types

```
R1(config)#ip router ospf 1
```

```
R1(config-rtr)#area 1 stub //seteaza tipul ariei in modul STUB
```

```
R1(config-rtr)#area 1 stub no-summary //seteaza tipul ariei in modul Totally STUB
```

```
R1(config-rtr)#area 1 nssa [no-summary] //seteaza tipul ariei in modul NSSA
```

Verificare:

```
R1#show ip route
```

```
R1#show ip ospf neighbor
```

```
R1#show ip protocols
```

```
R1#show ip ospf interface Gi0/0
```

```
R1#show run | section ospf
```

Configurare EIGRP

```
R1(config)#router eigrp AS
```

```
R1(router-config)#network IP_Retea Wildcard_Mask
```

```
R1(router-config)#no auto-summary
```

```
R1(config)#router eigrp 123
```

```
R1(router-config)#network 192.168.12.0 0.0.0.255
```

```
R1(router-config)#network 192.168.13.0 0.0.0.255
```

```
R1(router-config)#no auto-summary
```

#router eigrp 123, in acest caz 123 reprezinta **AS-ul (Autonomous System)** si poate avea orice valoarea de la 1 la 65536. **Important** este ca acest **AS** sa fie **la fel** pe toate Routerele.

Verificare:

```
R1#show ip route
```

```
R1#show ip eigrp neighbor
```

```
R1#show ip protocols
```

```
R1#show ip eigrp topology
```

```
R1#show run | section eigrp
```

b) IPv6

NOTE: pe fiecare Router in parte trebuie data aceasta comanda: R1(config)#**ipv6 unicast-routing**

Configurare OSPFv3

R1(config)#**ipv6 router ospf 1** //porneste procesul OSPFv3

R1(config-rtr)#**exit**

R1(config)#**interface Gig0/0**

R1(config-if)#**ipv6 ospf 1 area 0** //porneste OSPFv3 pe interfata

R1(config-if)#**ipv6 ospf network [point-to-point | broadcast]** //seteaza tipul interfetei in OSPFv3

OSPF Area Types

R1(config)#**ipv6 router ospf 1**

R1(config-rtr)#**area 1 stub** //seteaza tipul ariei in modul STUB

R1(config-rtr)#**area 1 stub no-summary** //seteaza tipul ariei in modul Totally
STUB

R1(config-rtr)#**area 1 nssa [no-summary]** //seteaza tipul ariei in modul NSSA

Verificare:

R1#**show ipv6 route**

R1#**show ipv6 ospf neighbor**

R1#**show ipv6 protocols**

R1#**show ipv6 ospf database**

R1#**show run | section ospf**

Configurare EIGRPv6

R1(config)#**ipv6 router eigrp 123**

//creeaza si porneste procesul EIGRPv6

R1(router-config)#**no shutdown**

R1(config)#**interface Gig0/0**

R1(config-if)#**ipv6 eigrp 123**

//adauga reteaua (interfata) in EIGRPv6

R1(config)#**interface Gig0/1**

R1(config-if)#**ipv6 eigrp 123**

Verificare:

R1#**show ipv6 route**

R1#**show ipv6 eigrp neighbor**

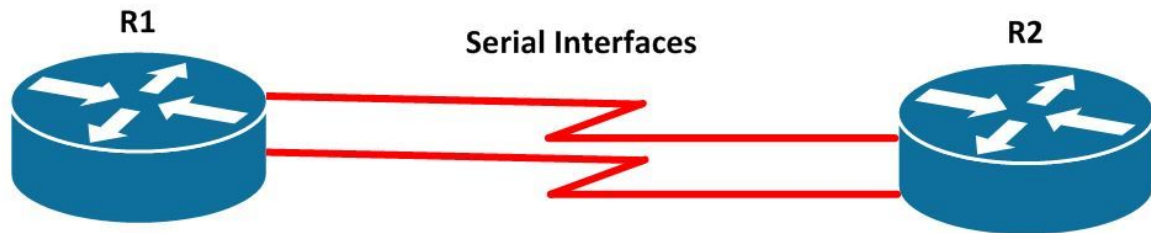
R1#**show ipv6 protocols**

R1#**show ipv6 eigrp topology**

R1#**show run | section eigrp**

Manual de Comenzi - CCNA Modulul 4

Configurare PPP



```
R1(config)#interface Serial0/0/1
```

```
R1(config-if)#encapsulation ppp
```

//pornim PPP pe interfata

PPP Autentificare prin PAP

Configul pe R1:

```
R1(config)#username R1 password cisco
```

//cream un username si o parola

```
R1(config)#interface Serial0/0/1
```

```
R1(config-if)#ppp authentication pap
```

//pornim autentificarea prin PAP

```
R1(config-if)#ppp pap sent-username R2 password cisco
```

//setam user-ul si parola pentru PAP

Configul pe R2:

```
R2(config)#username R2 password cisco
```

```
R2(config)#interface Serial0/0/0
```

```
R2(config-if)#ppp authentication pap
```

```
R2(config-if)#ppp pap sent-username R1 password cisco
```

PPP Autentificare prin CHAP

```
R1(config)#username R1 password cisco //cream un username si o parola
R1(config)#interface Serial0/0/1
R1(config-if)# ppp authentication chap //pornim autentificarea prin CHAP
```

Configurare PPP Multilink



```
R1(config)#interface Serial0/0/1
R1(config-if)#no ip address //se elimina adresa IP pentru ca va fi pe interfata principala (Multilink 1)
R1(config-if)#ppp multilink //formarea unui grup Multilink si asocierea cu acesta
R1(config-if)#ppp multilink group 1

R1(config)#interface Serial0/0/0
R1(config-if)#no ip address
R1(config-if)#ppp multilink //formarea unui grup Multilink si asocierea cu acesta
R1(config-if)#ppp multilink group 1

R1(config)#interface Multilink 1
R1(config-if)#ip address 192.168.1.1 255.255.255.0
```

Verificare:

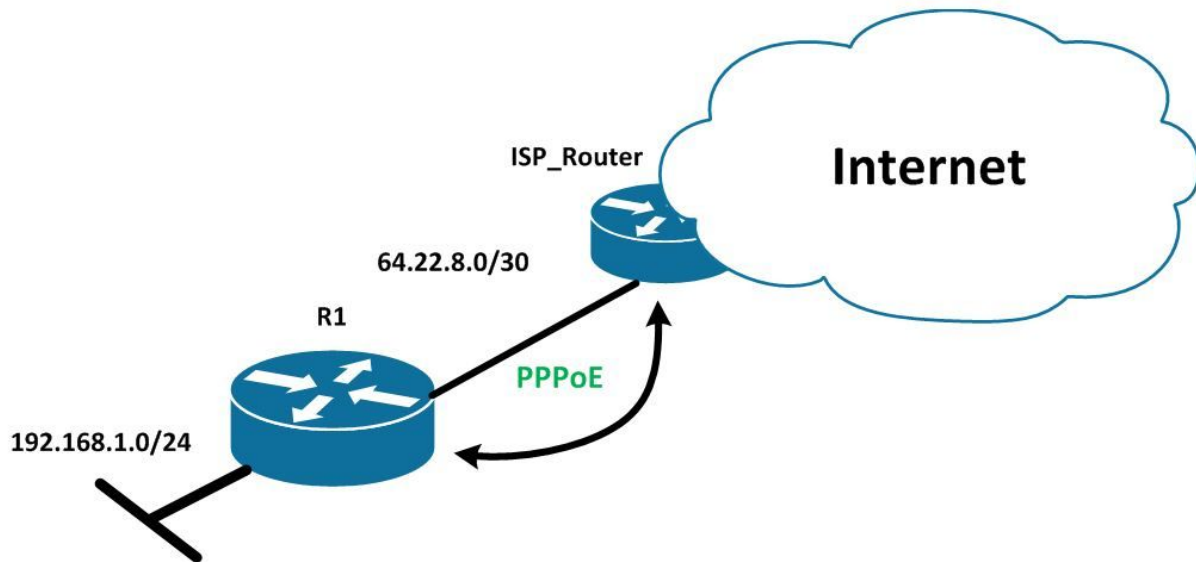
R1#show interface Serial0/0/1

R1#show ip interface brief //verificam daca interfata este up up

R1#show ppp multilink

R1#debug ppp negotiation

Configurare PPPoE



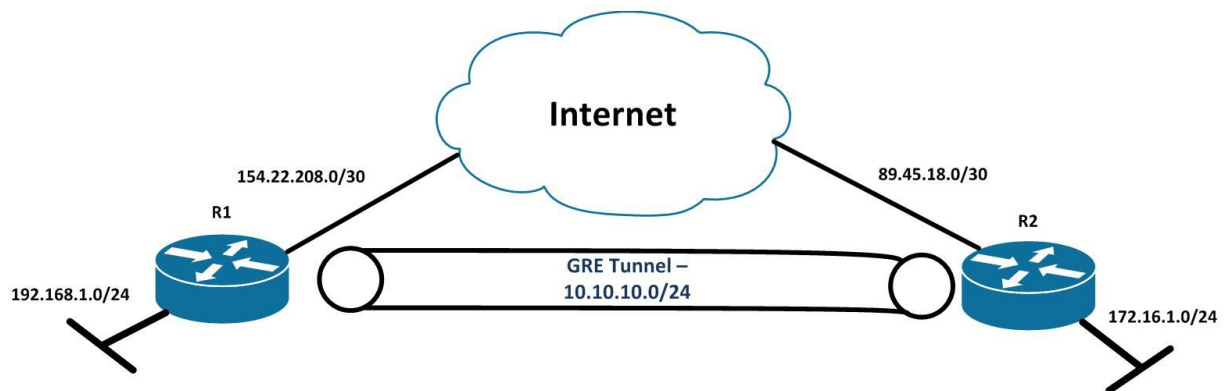
```
R1(config)#interface Dialer 1
R1(config-if)#ip mtu 1492
R1(config-if)#ip address negotiated
R1(config-if)#encapsulation ppp
R1(config-if)#dialer pool 1
R1(config-if)#ppp authentication chap
R1(config-if)#ppp chap hostname ID_ISP
R1(config-if)#ppp chap password ParolaS#CretA
```

Verificare:

```
R1#show ip interface brief
R1#show pppoe session
R1#debug ppp negotiation
```

Tunelare prin GRE si VPN site-to-site

In exemplul de mai jos vom configura, in primul rand, un tunel GRE intre cele 2 Routere, R1 si R2, iar in al doilea rand vom configura un tunel securizat (VPN) intre cele 2 retele.



Configurare Tunel GRE

```
R1(config)#interface Tunnel1
```

```
R1(config-if)# ip address 172.16.1.1 255.255.255.0
```

```
R1(config-if)# ip mtu 1400
```

```
R1(config-if)# ip tcp adjust-mss 1360
```

```
R1(config-if)# tunnel source 1.1.1.1
```

```
R1(config-if)# tunnel destination 2.2.2.2
```

Verificare:

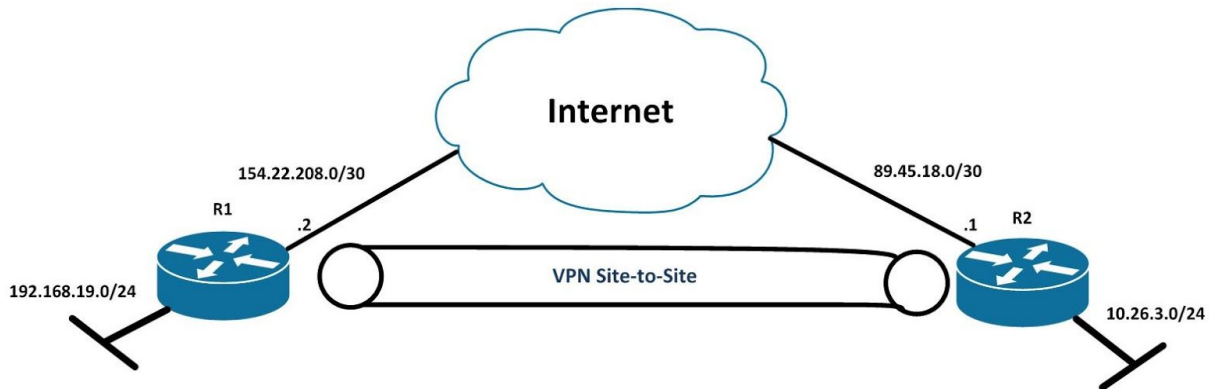
```
R1#show ip interface brief
```

```
R1#show ip interface Tunnel1
```

```
R1#show run | section Tunnel1
```

Configurare IPSec VPN (Site-to-Site)

Acum vom configura un tunel VPN IPSec intre cele 2 Routere.



==IKE Phase 1==

```
R1(config)#crypto isakmp policy 10
```

```
R1(config-isakmp)#encryption aes
```

```
R1(config-isakmp)#hash sha512
```

```
R1(config-isakmp)#authentication pre-share
```

```
R1(config-isakmp)#group 5
```

```
R1(config)#ip access-list extended VPN-ACL
```

```
R1(config-ext-nacl)#permit ip 10.1.0.0 0.0.0.255 10.2.0.0 0.0.0.255
```

```
R1(config)#crypto isakmp key InvataRetelisticaKEY address 10.0.0.0 255.255.255.0
```

==IKE Phase 2==

```
R1(config)#crypto ipsec transform-set NUME-SET esp-aes 256 esp-sha384-hmac
```

```
R1(cfg-crypto-trans)#mode [tunnel | transport] - cripteaza de la Layer 3 (IP) in sus
```

```
R1(config)#crypto map NUME-MAP 10 ipsec-isakmp
```

```
R1(config-crypto-map)#match address VPN-ACL
```

```
R1(config-crypto-map)#set peer 10.0.0.2
```

```
R1(config-crypto-map)#set transform-set NUME-SET
```

```
R1(config)#interface Gi0/0
```

```
R1(config-if)#crypto map NUME-MAP
```

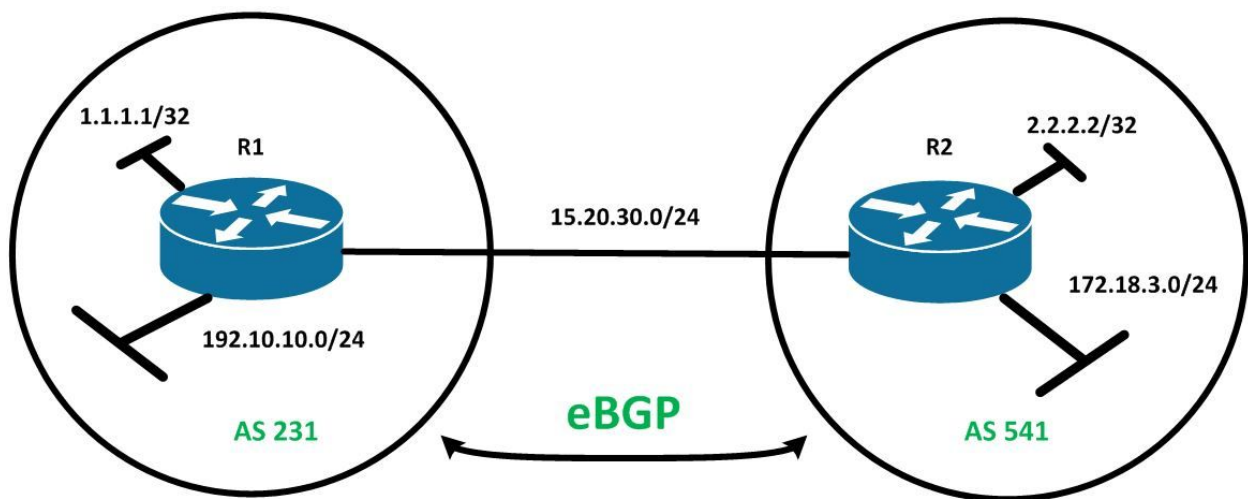
Verificare:

```
R1#show crypto ipsec sa
```

```
R1#show crypto isakmp sa
```

```
R1#debug crypto [isakmp | ipsec]
```

Configurare eBGP



```
R1(config)#router bgp AS
```

```
R1(config-rtr)#neighbor X.Y.Z.W remote-as Neighbor_AS
```

```
R1(config-rtr)#network Network_address mask 255.255.255.0
```

```
R1(config-rtr)#neighbor X.Y.Z.W ebgp-multihop 5
```

```
R1(config-rtr)#neighbor X.Y.Z.W update-source Loopback 1
```

```
R1(config)#interface Loopback 1
```

```
R1(config-if)#ip address 1.1.1.1 255.255.255.0
```

```
R1(config)#ip route 2.2.2.2 255.255.255.0 15.20.30.10
```

R1(config)#**router bgp** 231

R1(config-rtr)#**neighbor** 2.2.2.2 **remote-as** 541

R1(config-rtr)#**neighbor** 2.2.2.2 **ebgp-multihop** 5

R1(config-rtr)#**neighbor** 2.2.2.2 **update-source** Loopback 1

R1(config-rtr)#**network** 192.10.10.0 **mask** 255.255.255.0

R2(config)#**interface** Loopback 1

R2(config-if)#**ip address** 2.2.2.2 255.255.255.0

R2(config)#**ip route** 1.1.1.1 255.255.255.0 15.20.30.5

R2(config)#**router bgp** 541

R2(config-rtr)#**neighbor** 1.1.1.1 **remote-as** 231

R2(config-rtr)#**neighbor** 1.1.1.1 **ebgp-multihop** 5

R2(config-rtr)#**neighbor** 1.1.1.1 **update-source** Loopback 1

R2(config-rtr)#**network** 172.18.3.0 **mask** 255.255.255.0

Verificare:

R1#**show ip route**

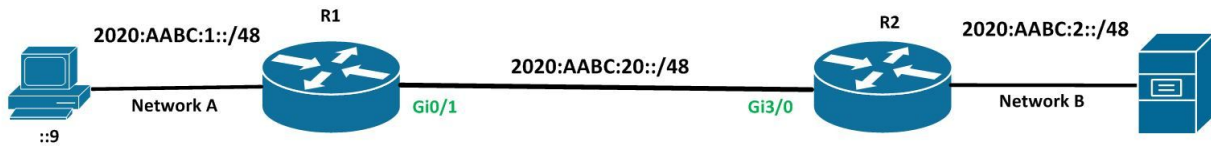
R1#**show ip bgp**

//ne arata rutele invatate prin BGP

R1#**show ip bgp summary**

//ne arata Routerale vecine din BGP

Configurare ACL pe IPv6



```
R2(config)#ipv6 access-list NUME_ACL
```

```
R2(config-ipv6-acl)#permit tcp 2020:AABC:1::/48 any eq 80
```

```
R2(config-ipv6-acl)#deny udp host 2020:AABC:1::9 eq 53 any
```

```
R2(config-ipv6-acl)#deny ipv6 any any
```

```
R2(config)#interface Gig0/1
```

```
R2(config-if)#ipv6 traffic-filter NUME_ACL [in | out]
```

Pentru linile VTY:

```
R1(config)#line vty 0 15
```

```
R1(config-line)#ipv6 access-class NUME_ACL_SSH_TELNET in
```

Verificare:

```
R1#show ipv6 access-list
```

```
R1#show run | section ipv6 access-list
```

Configurare SNMP

```
R1(config)# access-list standard 1 permit 192.168.1.10
```

```
R1(config)#snmp-server view NUME_VIEW oid-tree {included | excluded}
```

```
R1(config)#snmp-server group NUME_GRUP v3 priv read NUME_VIEW access 1
```

```
R1(config)#snmp-server user USERNAME NUME_GRUP v3 auth {md5 | sha}  
auth-password priv {des | 3des | aes {128 | 192 | 256}} privpassword
```

Configurare SPAN (Switchport Analyzer)

```
SW1(config)#monitor session 1 source interface GigabitEthernet 0/1
```

```
SW1(config)#monitor session 1 destination interface GigabitEthernet 0/5
```

Verificare:

```
SW1#show monitor
```

Configurare IP SLA

```
R1(config)#ip sla 1
```

```
R1(config-ip-sla)#icmp-echo 192.168.1.5
```

```
R1(config-ip-sla-echo)#frequency 30
```

```
R1(config)#ip sla schedule 1 start-time now lifetime
```

Verificare:

```
R1#show ip sla configuration
```

```
R1#show ip sla statistics
```